Fourth Annual Report

Advisory Committee on Heavy Oil and Oil Sands Development

1987
1988
1989

Contents

Letters of Transmittal	2
Statement of the Chairman	4
Role of the Committee	5
Committee Membership	6
Resources and Development	7
Committee Activity and Operations	11
Summary of Committee Meetings and Travel	15
MAP	
Alberta Oil Sands/Heavy Oil Areas	9

COPIES OF THIS REPORT MAY BE OBTAINED FROM:
Information Centre
Alberta Energy/Forestry, Lands and Wildlife
Main Floor, Bramalea Building
9920 - 108 Street, Edmonton, Alberta
T5K 2M4
Telephone: (403) 427-3590

Advisory Committee on Heavy Oil and Oil Sands Development

ISSN 0825-8856

ISBN 0-86499-508-3

Pub. No. I/205

Edmonton 1987

Alberta
ENERGY

Alberta
ENERGY

Office of the Minister

Legislature Building, Edmonton, Alberta, Canada T5K 2B6 403/427-3740

December 31, 1987

To Her Honor
Helen Hunley
Lieutenant-Governor
Province of Alberta

Madam:

I have the honor to transmit the Fourth Annual Report of the Advisory Committee on Heavy Oil and Oil Sands Development.

Respectfully submitted,

Neil Webber

Neil Webber
Minister of Energy

LEGISLATIVE ASSEMBLY
ALBERTA

December 31, 1987

To The Honorable Neil Webber
Minister of Energy

Sir:

I have the honor to transmit the Fourth Annual Report of the Advisory Committee on Heavy Oil and Oil Sands Development.

Respectfully submitted,

Bill Payne

W.E. (Bill) Payne, MLA
Chairman

Statement of the Chairman

The Advisory Committee on Heavy Oil and Oil Sands Development has now completed its fourth year of operations. The final section of this annual report is a summary of our meetings and travel during the past year. As that summary illustrates, the Advisory Committee continues to maintain a strenuous and diligent schedule of meetings with industry, communities and government. The committee believes that these efforts have helped to foster an effective and continuous communication among all the participants involved in the development of Alberta's valuable heavy oil and oil sands resources.

Over the past year, the Advisory Committee met with senior industry representatives in Calgary and with senior government people in Edmonton. Visits were also conducted to the Fort McMurray and Peace River areas to re-acquaint the committee members with development activities there and to identify new or continuing issues. These concerns have been discussed with the parties involved and, when necessary, the committee has made recommendations or requested review and action by appropriate government agencies.

The world price of crude oil dropped drastically in 1986. This severely affected the heavy oil and oil sands industry in particular. Many projects became marginally economic at best and were either shut down, reduced in size or postponed. An upturn in world oil prices and a renewed interest in investing in Alberta's heavy oil and oil sands sector occurred in 1987. New projects or expansions are being contemplated in all three major deposit areas: Athabasca, Cold Lake and Peace River. Total proposed investment could range as high as $10 billion. In addition, the need for upgrading facilities is being assessed by industry and government. However, construction on these projects will depend on a number of factors, including a further strengthening in the long-term price of oil and finalizing financial arrangements between the companies involved and the federal and provincial governments.

When the Advisory Committee on Heavy Oil and Oil Sands Development was established in 1983, it was given a time frame of five years for operations. In anticipation of continued development in the industry, and in recognition of the impact this development is likely to have, the government has extended the mandate of the Advisory Committee for an additional three years. This extension will allow the committee to continue to monitor the effects of growth, encourage improved communications and advise the government on remedial actions.

Bill Payne

Bill Payne, MLA
Chairman

Role of the Committee

The Advisory Committee on Heavy Oil and Oil Sands Development was established by the Department of Energy and Natural Resources Amendment Act, 1983, and re-confirmed by the Department of Energy Act, 1986. The first meeting was held on July 4, 1983.

The mandate of the Advisory Committee was to continue until December 31, 1987. On April 15, 1987, however, the Lieutenant Governor in Council ordered the continuance of the Advisory Committee for an additional three years until December 31, 1990 (Order in Council 245/87).

The Advisory Committee was formed in recognition of the impact on communities by intense and accelerated growth from heavy oil and oil sands development. It monitors such growth and anticipates problems.

The committee advises the Government of Alberta on the need for, and scheduling of, implementation of government programs that provide public services and facilities in areas of the province affected by the development of heavy oil or oil sands resources. Such recommendations will be in keeping with the pace and scale of resource development.

The Advisory Committee provides a continuing liaison between the Government of Alberta and the communities that are or may be affected by the anticipated development of heavy oil or oil sands resources in their vicinity. The committee hears and reviews the concerns of residents regarding the possible effects of development on their communities, and brings these concerns and suggestions to the attention of the government.

In general, the committee encourages and facilitates continuing communications among the organizations engaged in developing the heavy oil and oil sands resources, the residents of communities of Alberta directly affected by that development, and the various provincial government departments and agencies concerned with the regulation of that development.

Committee Membership

The legislation that established the Advisory Committee on Heavy Oil and Oil Sands Development also prescribes its membership to ensure balanced representation.

The chairman is a Member of the Legislative Assembly of Alberta and the vice-chairman is a representative of the provincial government departments concerned with management of the resource. Three members are appointed to represent residents of heavy oil and oil sands areas. Industry and the Energy Resources Conservation Board (ERCB) are also represented.

The committee members bring to the committee's work a great deal of experience, expertise and insight pertinent to the technology and socio-economic impacts of heavy oil and oil sands resource development in Alberta.

Members of the Advisory Committee on Heavy Oil and Oil Sands Development:
Seated (left to right) Bill Slawuta, Bonnyville; Bill Payne, MLA — Chairman; Ralph Evans, Energy Resources Conservation Board.
Standing (left to right) Don McGladdery, Fort McMurray; Neil Gilliat, Slave Lake; Dick Aberg, Industry; Lanny Coulson, Executive Director; Les Cooke, Alberta Forestry, Lands and Wildlife — Vice-Chairman.

Resources and Development

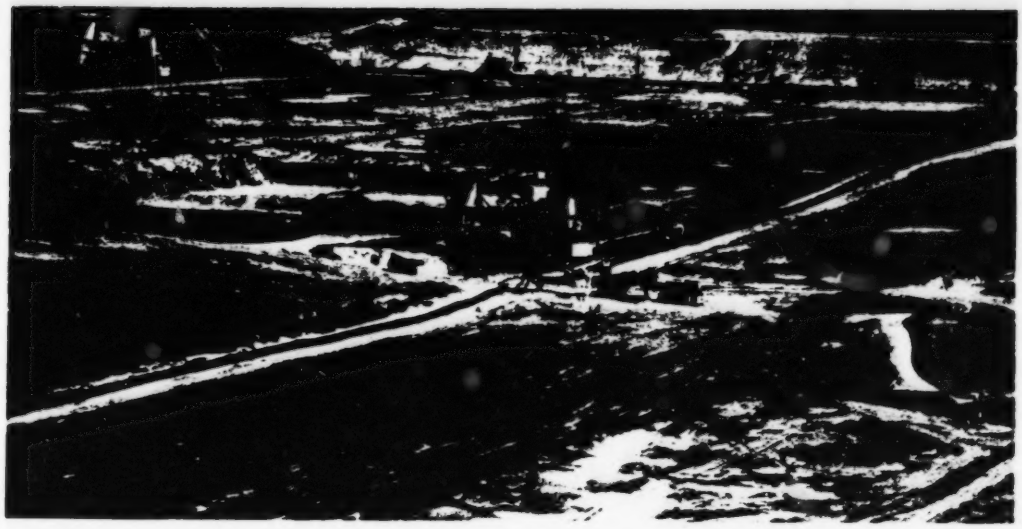
Because oil prices remained low in 1986, relatively few major projects were under construction during 1987. However, reflecting the long-term nature of oil sands and heavy oil activities, and the optimistic outlook of the industry, a number of operators used this lull in field construction activity to concentrate on planning, making applications and obtaining the necessary approvals for major future projects or expansions.

The Syncrude Group, operators of the world's largest synthetic crude oil production facility, filed an application with the Energy Resources Conservation Board for an expansion of over 50 per cent to its surface mining, extraction and upgrading project. At the time of this writing, the application was being extensively reviewed by the ERCB. Syncrude's expansion, estimated to cost $3.9 billion, would utilize hydrogen addition technology to further supplement the coking or carbon rejection technology already in use, as well as the initial increment of hydrocracking currently under construction. It would significantly increase synthetic crude oil production capacity, but achieve a net reduction in environmental impact.

Suncor, operator of the other surface mining facility in the Athabasca oil sands deposit, announced plans for a smaller, but still significant, expansion/debottlenecking of its extraction and upgrading plants. This would allow appoximately 3 000 m^3/d (cubic metres per day) of additional synthetic crude oil output, of which about half would be from other bitumen producers. In mid-October, however, a fire at the project caused a virtual shutdown of the plant for several months.

Although no formal applications have been made, a group of companies known as OSLO (Other Six Leases Operation), currently participants in the Syncrude project, has made a preliminary announcement that it is investigating the feasibility of a separate $4 billion mining project in the Athabasca oil sands deposit near Kearl Lake. No timetable for development has been released.

Also in the mining area, the Underground Test Facility, operated by the Alberta Oil Sands Technology and Research Authority



(AOSTRA), received approval to diversify its experimentation activities. In conjunction with Chevron Canada Ltd., horizontal wells would be used to test the HASDrive (Heated Annulus Steam Drive) concept. In this process, steam circulating through an outer pipe in the horizontal well provides a heated zone around the well and a hot fluid medium, both of which promote flow of crude bitumen into the well tubulars, and from there into the bitumen collection system.

In another untried oil sands technology development, the firm of C-H Synfuels applied to conduct a dredging test in the oil sands near the City of Fort McMurray. The application is still being reviewed by the regulatory authorities.

BP Canada Resources obtained approval for an experimental jet leaching project to evaluate bitumen recovery from intermediate depth oil sands deposits. Hot leaching fluid would be injected down a number of wells where the agitation caused by the jetting action would remove the bitumen from the sand, leaving the sand in place.

In the Cold Lake area, Esso proceeded with equipment modifications and "debottlenecking" at Phases 1 to 6 of its Cold Lake production project to increase its productive capacity from 9 000 to 12 000 m^3/d. Esso also filed an application with the ERCB to slightly modify the location and development plan for its next four phases (Phases 7-10) of this major industrial development. Esso announced additional experimental activities at its Leming project, a relatively large experimental scheme adjacent to the Cold Lake project. The approved productive capacity of the combined Esso Cold Lake commercial and experimental projects is 21 000 m^3/d.

BP/Petro Canada, operators of the Wolf Lake project, the other large commercial oil sands in situ project currently in the Cold Lake deposit, commenced expansion activities by adding several hundred producing wells and increasing productive capacity from 1 100 to 3 300 m^3/d.

Two other small experimental activities commenced in the Cold Lake deposit, one by Amoco at Soars Lake and one by Mobil at Iron River. Each project involves a quarter section of land at this time.

In the Peace River deposit, Shell Canada filed an application to quintuple the size of its commercial in situ oil sands project. Ultimate productive capacity would be 8 000 m^3/d. Whereas the other in situ projects primarily use the steam cycling process, Shell has successfully pioneered the use of an unusual pressure cycle steam drive.

Alberta Oil Sands and Heavy Oil Areas
Active Thermal Projects

PROJECTS

Athabasca

* 1. Syncrude Mildred Lake
* 2. Suncor Mildred Lake
3. AOSTRA McKay
4. Canterra Kearl Lake
5. B.P. Tar River
6. Amoco Gregoire Lake
7. Unocal McLean
8. Gulf Pelican
9. Amoco Brintnell
10. Petro Can Hangingstone
11. AEC Ipiatik Lake

Peace River

*12. Shell Cadotte Lake

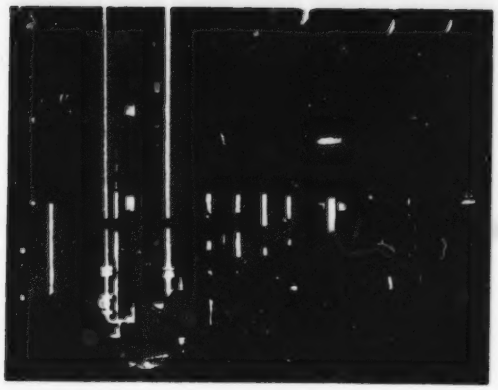
Cold Lake

*13. Suncor Burnt Lake
*14. Dome Primrose
*15. B.P. Wolf Lake (2)
*16. Esso Cold Lake (3)
17. Canoxy Manitokan
18. Husky Tucker Lake
19. Mobil Wolf Lake (2)
20. Bow Valley Marie Lake
21. Drummond Ardmore
22. Koch Fort Kent
23. Suncor Fort Kent
24. Amoco Beaverdam
*25. Murphy Lindbergh (2)
*26. Amoco Lindbergh
*27. Pan Canadian Lindbergh
28. Westmin Lindbergh (3)
*29. Dome Lindbergh

Heavy Oil

30. Canoxy Morgan
31. Murphy Morgan
32. Home Lloydminster
33. Mobil Kitscoty
34. Mobil Silverdale
35. Can N.W. Wildmere
36. Dome Morgan
37. Petro Can Viking–Kinsella
38. Koch Wildmere
39. Norcen Provost
40. Dome Atlee–Buffalo
41. Can N.W. Atlee–Buffalo
42. AEC Suffield
43. PanCanadian Countess

* Commercial Projects



There are now 11 approved commercial oil sands schemes, nine of which are active to some degree. There are also some 31 active experimental projects, 30 investigating in situ techiques and one using mining-related techniques.

In the heavy oil area, in addition to a large number of pools producing heavy oil under primary depletion methods, there are 21 experimental schemes. Thirteen of these are thermal recovery projects, while the other eight are utilizing various chemical displacement methods.

A good deal of industry and government attention was captured in 1987 by the activities of the Oil Sands Task Force operating under the auspices of the Alberta Chamber of Resources. The task force carried out several studies which demonstrated significant advantages in a "regional upgrader" concept to assist oil sands development. In addition to discussions between industry and government officials, further technical studies are being carried out to refine the concept and investigate suitable fiscal arrangements.

Besides these resource production projects, considerable effort is being devoted by the industry, AOSTRA, Alberta Research Council, Alberta Environment, Alberta Energy, and the ERCB on process and production technology development. This work is essential to improve reliability, reduce costs and resolve outstanding concerns. Areas of investigation include produced fluids separation, water treatment for re-use, bitumen extraction, upgrading, products transportation, byproducts treatment and disposal.

Several operators have indicated, confidentially, that they are planning new oil sands projects in the near future. By using this type of information and established trends, the Advisory Committee is confident that the oil sands industry in Alberta will remain reasonably healthy and vibrant for many years to come.

Committee Activities and Operations

When the Advisory Committee was formed in 1983, the members devoted much time and effort to understanding the technology of heavy oil recovery and the problems faced by the communities having to anticipate and prepare for growth. Formal and informal meetings were held in several communities as well as with industry. In subsequent years, these activities were continued so that the members would be aware of the needs of the industry and the communities as they coped with the financial, social and infrastructure requirements of new and rapid growth.

Considerable effort was directed at communicating to the various government departments and agencies, the concerns and issues identified by the municipalities and the industry. The response from government has been positive. Particularly beneficial has been the participation of the Interdepartmental Liaison Committee with representation from senior management levels of 14 government departments.

In line with its mandate to encourage communications, the Advisory Committee has, in previous years, also provided a new forum in which the industry, government and local municipalities in the Cold Lake Oil Sands Area could meet and interact. This innovative technique was tried in the Cold Lake area because growth pressures have been more pronounced there and a large number of operators and municipalities were involved. Two workshops were held, one focusing on "rural" issues and one on "urban" issues. They were very successful and resulted in a number of recommendations being forwarded to the appropriate agencies.

In its fourth year, the Advisory Committee has worked to maintain and improve the level of communication that will enable all participants to find acceptable solutions to the identified problems.

Individual members of the committee have attended hearings and meetings in order to report on the current concerns of interest groups, associations and organizations. These have had either a sectoral focus, such as AOSTRA, or a geographic focus, such as the

Northern Alberta Development Council. In addition, the committee has met over the past year with individual provincial government departments including Career Development and Employment, Environment, Municipal Affairs and Forestry, Lands and Wildlife.

In February, a joint meeting with the Interdepartmental Liaison Committee was held. Later in the year, the committee met with senior industry representatives in Calgary. Enthusiastic and positive responses were encountered in both meetings. Industry was eager to continue and accelerate development of the heavy oil and oil sands resource and to work with the local people and regulatory agencies to ensure that any impacts are manageable.

The Advisory Committee also re-visited two areas in the past year. While some new and continuing concerns were identified in both Fort McMurray and Peace River, the overall impression from both communities was one of optimism and anticipation of growth. The communities were very much aware of the benefits to be accrued from heavy oil and oil sands development, and appeared to be well prepared to handle any expected influx of people. Smaller communities, in particular some native settlements, continue to be less well-prepared and the committee continues to encourage that the situation be monitored and programs be available to assist the residents when required.

Financial Concerns

Financial concerns were identified by municipalities most frequently to the Advisory Committee last year. This concern has been consistently identified over the past few years, and has two major components. Firstly, there are problems with "front-end" financing of the infrastructure that is required to support heavy oil and oil sands development. Communities must borrow to finance municipal services needed to meet the anticipated growth.

The second aspect concerns "ongoing" finances and is essentially a tax base problem. Often the industry creating a demand for services is outside the boundaries of a municipality. The development, with its tax base, is beyond the jurisdiction of the affected municipality. While this problem appears to be handled better in the case of Improvement Districts through industrial tax transfers, no adequate mechanism is in place for other municipalities.

The Advisory Committee is pleased that Alberta Municipal Affairs has agreed to co-ordinate a study to investigate these problems. The collection of background information for this study is proceeding well and the development of options and recommendations is expected in 1988.

Another identified financial concern involves changes and possible elimination of the machinery and equipment tax. Some Boards of Education are concerned about the impact any changes might have on their assessment base. This concern was forwarded to the responsible ministers. The Advisory Committee has been assured that there will be no significant changes in the property tax system without extensive consultation with all affected parties. Equity in educational financing is a provincial concern and currently is being discussed as such.

Communications

The major role of the Advisory Committee is to encourage communication and co-ordination in current and future heavy oil and oil sands developments. The Advisory Committee believes that communication continues to be the key. With well-informed participants, problems will be identified early and mutually acceptable solutions devised. A high degree of willingness to share and exchange information was noted over the year by the Advisory Committee.

As catalysts of communications, the Advisory Committee would commend three specific groups for being particularly effective in facilitating the exchange of information. While quite different in purpose, structure and operation, they have all been remarkably successful in meeting the needs of the particular situation.

The first of these is the Cold Lake Citizens Advisory Committee. Established several years ago, this committee continues to provide a

worthwhile forum for the residents of the area to meet with representatives of industry and government.

The second is the Fort McKay Interface Committee. This committee, initiated originally by the ERCB, consists of representatives from the native community, government agencies and the two oil sands plant operators in the vicinity. It is chaired by an independent fourth party. Much of the credit for the co-operation between the native community and the industry rests with the work of this group.

The third group is the Mackenzie Regional Planning Commission in the Peace River area. The Advisory Committee noted significant community-industry rapport in the Peace River area. While all parties deserve credit for this, the Mackenzie Regional Planning Commission deserves special mention for the strong positive role it plays in facilitating communication and resolution of potential problems.

Environmental Concerns

Maintaining a high quality environment in conjunction with development of the heavy oil and oil sands resource remains a priority of all parties. There is continued support for high environmental standards on water quality, air quality and land reclamation. In the Cold Lake deposit area, water management has been identified most often as the main environmental concern of residents and industry. In response, Alberta Environment has prepared the Cold Lake/Beaver River Water Management Study which receives considerable support from both the general public and industry.

One provision of this study, dealing with water supply, calls for the construction of a pipeline from the North Saskatchewan River with an implementation date of 1991. The communities, concerned with the possible effects of industrial withdrawal of surface and groundwater, have indicated strong support for the pipeline and its implementation schedule. While accepting the pipeline proposal in principle, industry has expressed some concerns with the implementation schedule. Improved technology has caused a reduction in industrial water requirements and the economic slowdown has resulted in project delays. The combined effect means that the amount of water required in 1991 may be considerably lower than identified in the Water Management Study, and suggests to industry that a delay in pipeline construction is warranted.

Alberta Environment remains committed to a 1991 implementation date, but notes that, to be effective, any water management plan must be flexible and responsive to changing demands. Alberta Environment staff will continue to work with industry to update future water requirements so that the 1991 implementation date can be reviewed as the 1989 project start-up date approaches.

Transportation Concerns

Alberta Transportation and Utilities continues to be responsive to the needs of the communities and industry. This is reflected in the lower number of concerns about roads that were registered with the Advisory Committee than in previous years. The notable exception is in the Fort McMurray area where there is community support for accelerated upgrading of Highway 63. The Advisory Committee has identified this issue to the Minister of Transportation and Utilities and added its own recommendation to that effect.

The Advisory Committee also commends the ongoing work of the ad hoc Steering Committee on Northern Road Development. This committee was created in 1986 with representatives from senior levels of Alberta Transportation and Utilities, Alberta Municipal Affairs, Alberta Forestry, Lands and Wildlife and the Northern Alberta Development Council.

One of the major projects initiated by this committee was the Northern Alberta Transportation System Study (NATSS). A private sector consultant has been commissioned to prepare a report that will identify the relationship between multi-modal transportation needs and socio-economic development for northern Alberta. It involves a review of historical transportation background material, an inventory of existing and proposed transportation facilities, and the identification and analysis of future transportation needs. The study, which will be used by decision makers who are working towards the overall improvement of the economic, social and infrastructure development of northern Alberta, is expected to be completed in early 1988.

1986 saw a significant recession in the entire petroleum industry. The heavy oil and oil sands sector was particularly hard hit, with many projects being cancelled, postponed or reduced in size. Prices for crude oil appear to have stabilized in 1987, and it is believed that the industry has now weathered this period of economic uncertainty. With improved prospects, proposals for new or expanded production are coming forward. With resurgent activity in the industry, the members of the Advisory Committee on Heavy Oil and Oil Sands Development expect their activities to increase in 1988. With its renewed mandate for operations, the Advisory Committee will actively continue to encourage effective communication and co-operation among industry, government and communities.

Summary of Committee Meetings and Travel

October 24, 1986 — Edmonton
A regular business meeting, including reports from all members, was held in Edmonton. The draft of the third annual report was reviewed and approved. A senior department representative from Alberta Career Development and Employment attended a portion of the meeting to explain the mandate of the department and discuss issues pertinent to that department. The results of the urban municipality/industry information exchange workshop held in Grand Centre in September were reviewed and evaluated in preparation for producing a summary report.

December 2, 1986 — Edmonton
The regular business meeting included a discussion with a senior departmental representative from Alberta Environment on issues and concerns pertinent to that department's mandate. The 1986 Annual Report and the Summary Report from the Grand Centre workshop were approved for distribution. Reports were presented by the committee members and a work plan for 1987 was developed.

January 13, 1987 — Edmonton
The Advisory Committee devoted its scheduled meeting to reviewing the status of development in the industry and analysing the issues identified by municipal authorities. This was in preparation for the upcoming meeting with the Interdepartmental Liaison Committee.

February 24, 1987 — Edmonton
The Advisory Committee held its regular business meeting in the morning. The afternoon saw a joint meeting with the Interdepartmental Liaison Committee. Senior officials from 14 government departments attended this meeting. The current status of development in the heavy oil and oil sands industry was reviewed and five specific issue areas were discussed. These included transportation, municipal financing, employment and training, environment, and housing and social services.

March 17, 1987 — Edmonton
Business at the March meeting of the Advisory Committee included reviewing the results of the meeting with the Interdepartmental Liaison Committee, preparing for the upcoming meeting with industry officials, and reports from members on activities in their respective sectors.

April 23, 1987 — Calgary
Following the regular business meeting in the morning, the Advisory Committee met with senior management from 11 companies involved in the development of the heavy oil and oil sands resource. A wide variety of issues were raised during the afternoon discussion including royalty structures, government regulations, the environment, surface rights, and housing and training of employees.

June 2, 1987 — Edmonton
Staff from Alberta Municipal Affairs joined the meeting to discuss the problems municipalities are facing in providing initial financing for infrastructure, and arranging the equitable distribution of tax revenues between jurisdictions. Staff from Alberta Forestry, Lands and Wildlife also attended to update the committee members on the status of resource management planning in the Cold Lake area. Results of the April meeting with industry were reviewed and the agenda for the upcoming visit to the Fort McMurray area confirmed. Some members attended portions of the 5th Biennial International Canadian Offshore and Onshore Petroleum Exhibition and Conference following the meeting.

June 18 and 19, 1987 — Fort McKay and Fort McMurray
The Advisory Committee travelled to the Fort McKay area on June 18 to meet with community leaders. On the return trip to Fort McMurray, the committee stopped at the AOSTRA Underground Test Facility to tour this unique experimental extraction project. The regular meeting of the committee was held in Fort McMurray in the evening. A working session was held the next morning with community leaders responsible for providing infrastructure and services in the Fort McMurray area. Members of the Advisory Committee also met with representatives of the business community.

July 13, 1987 — Edmonton
The Advisory Committee devoted the morning portion of its scheduled meeting to a discussion on the issues and concerns identified during the visit to the Fort McMurray area. In the afternoon, the members held their annual meeting with the Minister of Energy, Dr. Neil Webber.

September 11, 1987 — Edmonton
Staff from Alberta Forestry, Lands and Wildlife attended the meeting to update the members on the status of resource management planning in the Fort McMurray area. Reports were received from the various members and details of the upcoming trip to the Peace River area confirmed.

October 29 and 30, 1987 — Peace River
On October 29, the Advisory Committee travelled to Peace River and in the evening hosted a working session with community leaders responsible for providing infrastructure and services in the Peace River area. The following day, the regular meeting of the committee was held. Members also met with representatives of the business community and toured the Shell Peace River heavy oil production project.

November 16, 1987 — Edmonton
Business at the November meeting included an evaluation of the visit to the Peace River area and a review of the committee's activities over the past year in preparation for the production of the annual report.

December 14, 1987 — Edmonton
A regular business meeting, including reports from all members, was held in Edmonton. The draft of the fourth annual report was reviewed and approved. A work plan for 1988 was also developed.